**Method and System for the Optimal**
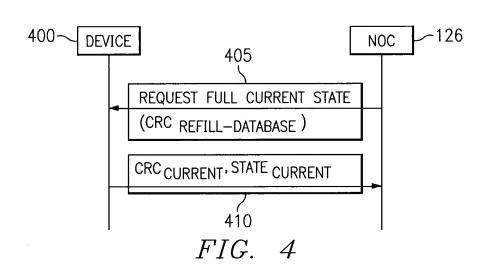**Formatting, Reduction and Compression of**
**DEX/UCS Data;**
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130

138 REGULAR DEX
TRANSMISSION

REGULAR DEX 138
TRANSMISSION

126

| WAN DEVICE |
|---|

Δ SCHEME

WAN
124

Δ SCHEME

| NETWORK OPERATIONS CENTER |
|---|

REGULAR DEX
TRANSMISSION

138

Δ SCHEME

| LAN DEVICE |
|---|

134

*FIG. 1*

400 — | DEVICE |

| NOC | —126

405

REQUEST FULL CURRENT STATE

$(CRC_{REFILL-DATABASE})$

$CRC_{CURRENT}, STATE_{CURRENT}$

410

*FIG. 4*

400 — | DEVICE |

| NOC | —126

605

REQUEST FULL REFILL STATE

$(CRC_{REFILL-DATABASE})$

$CRC_{REFILL}, STATE_{REFILL}$

610

*FIG. 6*

**Method and System for the Optimal Formatting, Reduction and Compression of DEX/UCS Data;**
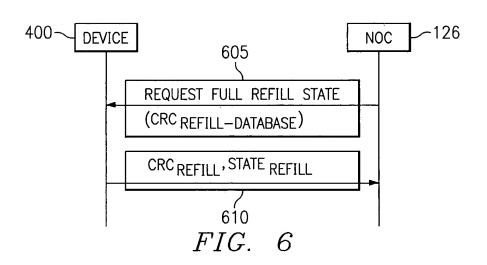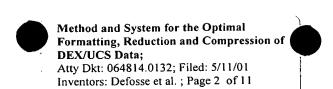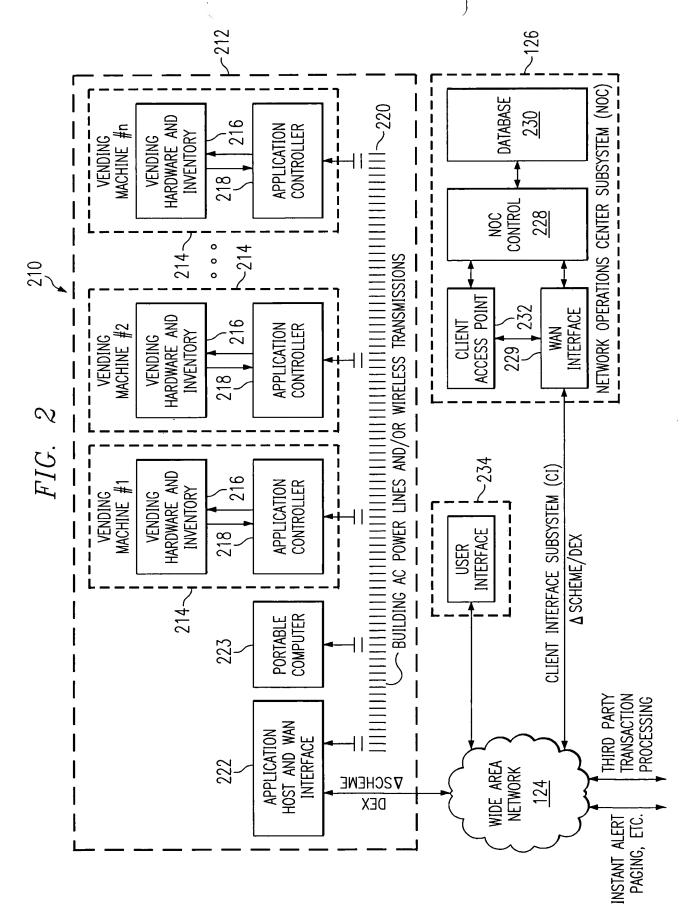Atty Dkt: 064814.0132; Filed: 5/11/01
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*FIG. 2*

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| SPECIAL FIELD | 305    FIELDS THAT DO NOT CHANGE FREQUENTLY   310 | FIELDS THAT CHANGE FREQUENTLY   315   320 | NON-STANDARD FIELDS BLOCK |
|---|---|---|---|
| (0) NSL*12 | (1) DXS*9259630007*VA*V1/1*1** | (46) VA1*100820*1935*100470-1922 | (84) MA5*ERROR*ACLO |
| | (2) SE*60*0001 | (47) CA2* | (85) PA5*ColNum |
| | (3) DXE*1*1 | (48) CA3*135040*38015*38225*588*135545*38290*38255*590 | |
| | (4) ST*001*0001 | (49) CA4*35975*1605*36130*1605 | |
| | (5) ID1*1296170514*GIII-VENDOR 67015-6*6*** | (50) CA6* | |
| | (6) ID4*2*1* | (51) CA17* | |
| | (7) CA1* | (52) DA2*0*0*0*0 | |
| | (8) BA1*CAI0004896040 85*BA30B   -2*7**ASSET | (53) TA2*0*0*0 | |
| | (9) DA1* | (54) PA2*299*14755*296*14680 | |
| | (10) LS*0100 | (55) PA2*399*19795*397*19745 | |
| | (11) PA1*1*35* | (56) PA2*241*12385*240*12360 | |
| | (12) PA1*2*35* | (57) PA2*231*11010*230*10985 | |
| | (13) PA1*3*35* | (58) PA2*139*7605*138*7580 | |
| | (14) PA1*4*35* | (59) PA2*380*19875*379*19850 | |
| | (15) PA1*5*35* | (60) PA2*125*7310*123*7235 | |
| | (16) PA1*6*35* | (61) PA2*71*4560*70*4535 | |
| | (17) PA1*7*35* | (62) PA2*50*3525*49*3500 | |
| | (18) PA1*8*35* | (63) PA2*0*0*0*0 | |
| | (19) PA1*9*35* | (64) PA2*0*0*0*0 | |
| | (20) PA1*10*35* | (65) PA2*0*0*0*0 | |
| | (21) PA1*11*35* | (66) EA2*D0*174 | |
| | (22) PA1*12*35* | (67) EA3*5 | |

*FIG. 3A*

TO FIG. 3B

**Method and System for the Optimal Formatting, Reduction and Compression of DEX/UCS Data;**
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*FIG. 3B*

FROM FIG. 3A

(23) LE*0100
(24) MA5*BAUD*9600
(25) MA5*SWITCH*UNLOCK*1**7
(26) MA5*TUBE2*
(27) MA5*PACKAGE*
(28) MA5*STATUS*
(29) MA5*CCOC*
(30) MA5*PREV*
(31) MA5*LANG*
(32) MA5*LITE*
(33) MA5*RFRG*
(34) MA5*BLC1*
(35) MA5*BLC2*
(36) MA5*DISC*
(37) MA5*OVER*
(38) MA5*SDEP*
(39) SD1*00000000000000
(40) EA2*CR**1
(41) VA2*0*14*0*14
(42) CA5*
(43) CA9*
(44) VA3*
(45) EA7*46*53

(68) G85*4292
(69) MA5*TUBE1*2*65*105*75
(70) MA5*SEL0*1,2*277*319
(71) MA5*SEL1*3,4*379*434
(72) MA5*SEL2*5,6*209*219
(73) MA5*SEL3*7*224*270
(74) MA5*SEL4*8*109*137
(75) MA5*SEL5*9*372*465
(76) MA5*SEL6*10*70*84
(77) MA5*SEL7*11*53*57
(78) MA5*SEL8*12*32*37
(79) MA5*SEL9-*0*0
(80) MA5*SEL10**0*0
(81) MA5*SEL11**0*0
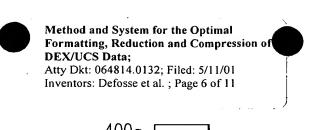(82) MA5*SEL12**0*0
(83) MA5*TIME*

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## FIG. 5A

400 — DEVICE    505    NOC — 126

510

$CRC_{REFILL} == CRC_{REFILL-DATABASE}$
$\Delta_{CURRENT} = STATE_{CURRENT} - STATE_{REFILL}$
$CRC_{CURRENT} = F(STATE_{CURRENT})$

515

REQUEST $\Delta_{CURRENT}$
$CRC_{REFILL-DATABASE}$

$CRC_{CURRENT}$, $\Delta_{CURRENT}$

520

SAVE TO DATABASE
$STATE_{CURRENT} = \Delta_{CURRENT} + STATE_{REFILL-DATABASE}$

## FIG. 5B

400 — DEVICE    505    NOC — 126

525

$CRC_{REFILL} \,! = CRC_{REFILL-DATABASE}$
$CRC_{REFILL-OLD} == CRC_{REFILL-DATABASE}$
$\Delta_{REFILL} = STATE_{REFILL} - STATE_{REFILL}$
$\Delta_{CURRENT} = STATE_{CURRENT} - STATE_{REFILL}$
$CRC_{CURRENT} = F(STATE_{CURRENT})$

530

REQUEST $\Delta_{CURRENT}$
$(CRC_{REFILL-DATABASE})$

$CRC_{REFILL}$, $CRC_{REFILL-OLD}$, $CRC_{CURRENT}$
$\Delta_{REFILL}$, $\Delta_{CURRENT}$

535

$STATE_{REFILL} = \Delta_{REFILL} + STATE_{REFILL-DATABASE}$
$STATE_{CURRENT} = \Delta_{CURRENT} + STATE_{REFILL}$
SAVE $STATE_{REFILL}$ AS $STATE_{REFILL-DATABASE}$
SAVE $CRC_{REFILL}$ AS $CRC_{REFILL-DATABASE}$
SAVE $STATE_{CURRENT}$

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400 — DEVICE          505          NOC — 126

REQUEST $\Delta_{CURRENT}$
$(CRC_{REFILL-DATABASE})$

545

STATE $_{REFILL}$, $CRC_{CURRENT}$
$\Delta_{CURRENT}$, $CRC_{REFILL}$

540

$CRC_{REFILL} \,! = CRC_{REFILL-DATABASE}$
$CRC_{REFILL-OLD} \,! = CRC_{REFILL-DATABASE}$
$\Delta_{CURRENT} = STATE_{CURRENT} - STATE_{REFILL}$

$$FIG.\ 5C$$

400 — DEVICE          705          NOC — 126

REQUEST $\Delta_{REFILL}$
$(CRC_{REFILL-DATABASE})$

715

$DATALENGTH_{REFILL} = 0xFFFF$

710

$CRC_{REFILL} == CRC_{REFILL-DATABASE}$

$$FIG.\ 7A$$

400          705          126

DEVICE                    NOC

REQUEST $\Delta_{REFILL}$
$(CRC_{REFILL-DATABASE})$

725

$CRC_{REFILL}$, $CRC_{REFILL-OLD}$, $\Delta_{REFILL}$

720

$CRC_{REFILL} \,! = CRC_{REFILL-DATABASE}$
$CRC_{REFILL-OLD} == CRC_{REFILL-DATABASE}$
$\Delta_{REFILL} = STATE_{REFILL} - STATE_{REFILL-OLD}$

$$FIG.\ 7B$$
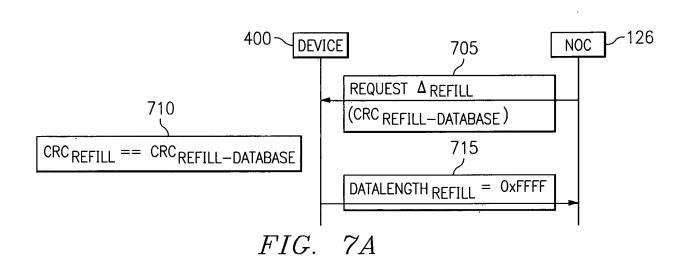
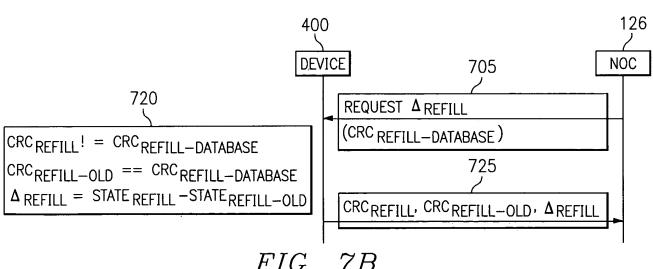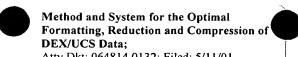**Method and System for the Optimal Formatting, Reduction and Compression of DEX/UCS Data;**
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400
DEVICE

705

126
NOC

730

$CRC_{REFILL}! = CRC_{REFILL-DATABASE}$

$CRC_{REFILL-OLD}! = CRC_{REFILL-DATABASE}$

REQUEST $\Delta_{REFILL}$

$(CRC_{REFILL-DATABASE})$

735

$CRC_{REFILL}, CRC_{REFILL-OLD}, STATE_{REFILL}$

*FIG. 7C*

400
DEVICE

126
NOC

805

$CRC_{REFILL}, CRC_{CURRENT},$

$\Delta_{CURRENT} = STATE_{CURRENT} - STATE_{REFILL}$

$CRC_{REFILL-DATABASE} = 0$

*getStructuredDexData*

REQUEST  COMPLETE  REFILL
REQUEST  DELTA  CURRENT

815

810

$CRC_{REFILL}, STATE_{REFILL},$
$CRC_{CURRENT},$

$\Delta_{CURRENT} = STATE_{CURRENT} - STATE_{REFILL}$

820

SAVE  TO  DATABASE

$CRC_{REFILL-DATABASE} = CRC_{REFILL}$

$STATE_{REFILL}$

$STATE_{CURRENT} = \Delta_{CURRENT} + STATE_{REFILL}$

*FIG. 8*

**Method and System for the Optimal
Formatting, Reduction and Compression of
DEX/UCS Data;**
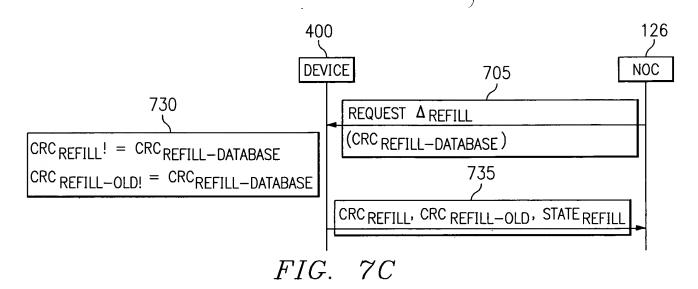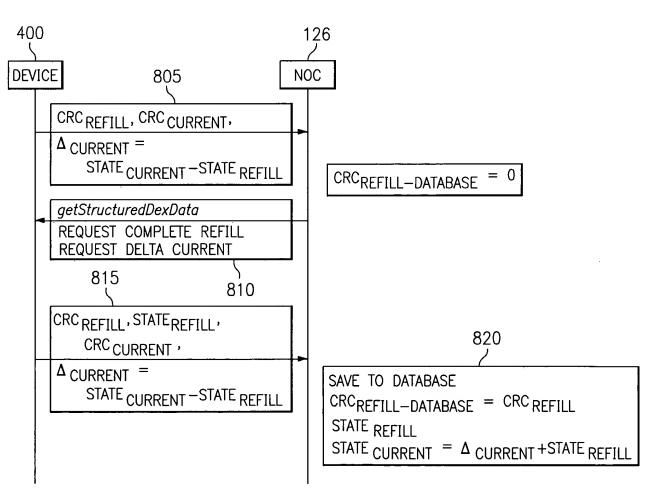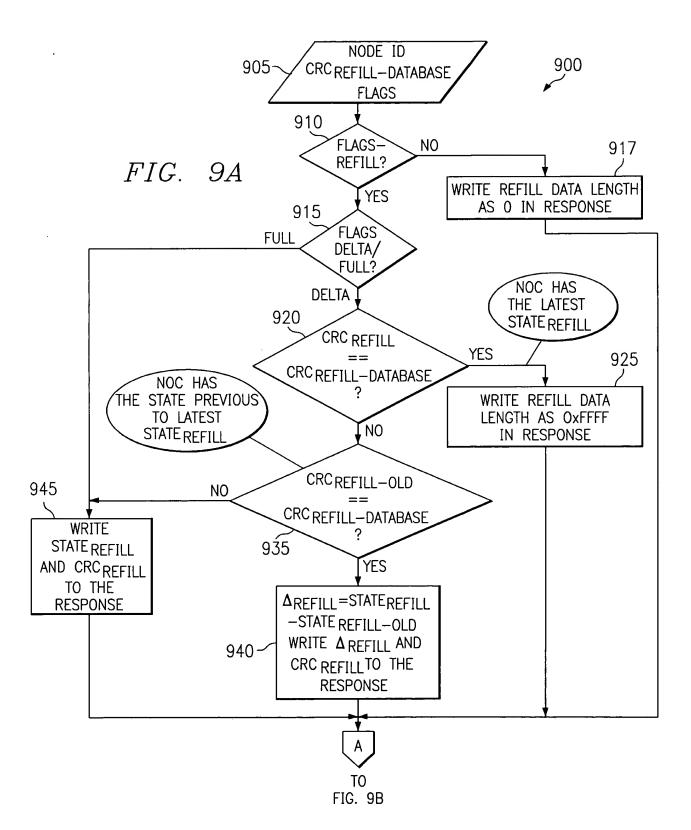Atty Dkt: 064814.0132; Filed: 5/11/01
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*FIG. 9A*

905 — NODE ID
$CRC_{REFILL}$ –DATABASE
FLAGS

900

910 — FLAGS–
REFILL?

NO → 917 — WRITE REFILL DATA LENGTH
AS 0 IN RESPONSE

YES

915 — FLAGS
DELTA/
FULL?

FULL

DELTA

920 — $CRC_{REFILL}$
==
$CRC_{REFILL}$ –DATABASE
?

YES → NOC HAS
THE LATEST
$STATE_{REFILL}$

925 — WRITE REFILL DATA
LENGTH AS 0xFFFF
IN RESPONSE

NO

NOC HAS
THE STATE PREVIOUS
TO LATEST
$STATE_{REFILL}$

935 — $CRC_{REFILL-OLD}$
==
$CRC_{REFILL}$ –DATABASE
?

NO

945 — WRITE
$STATE_{REFILL}$
AND $CRC_{REFILL}$
TO THE
RESPONSE

YES

940 — $\Delta_{REFILL} = STATE_{REFILL}$
$-STATE_{REFILL-OLD}$
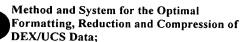WRITE $\Delta_{REFILL}$ AND
$CRC_{REFILL}$ TO THE
RESPONSE

A

TO
FIG. 9B

**Method and System for the Optimal Formatting, Reduction and Compression of DEX/UCS Data;**
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*FIG. 9B*

**Method and System for the Optimal**
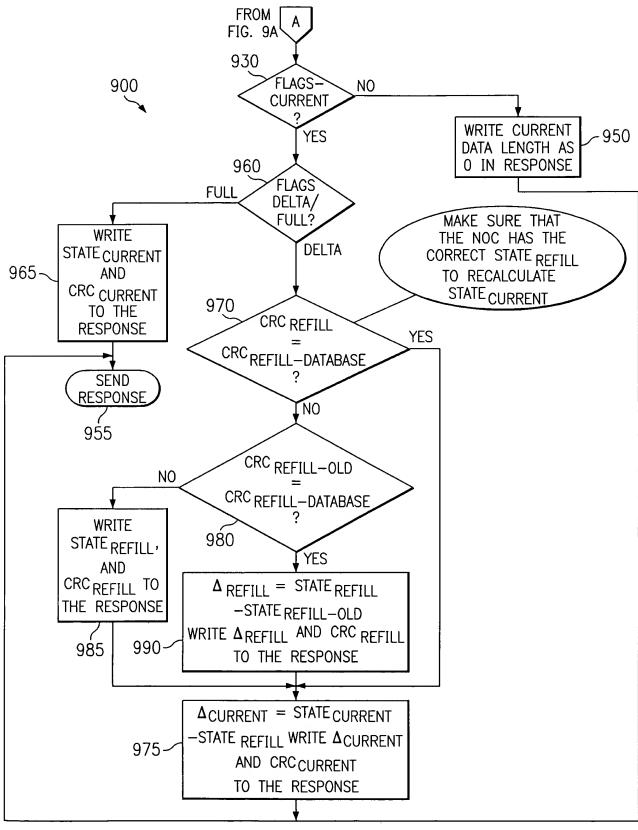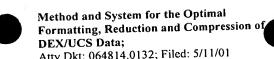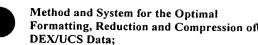**Formatting, Reduction and Compression of**
**DEX/UCS Data;**
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# FIG. 10A

1005 — DATALENGTH $_{REFILL}$

NO REFILL DATA
IN RESPONSE

1010

DATALENGTH $_{REFILL}$ ==0? —— YES

1000

NO

$CRC_{REFILL} = CRC_{REFILL-DATABASE}$

1025

DATALENGTH $_{REFILL}$ ==FFFF? —— YES

1015

NO

REFILL DATA HAS
NOT CHANGED

1035 —— STATUS $_{REFILL}$,
DATE/TIME $_{REFILL}$
FLAG $_{REFILL}$, CRC $_{REFILL}$
CRC $_{REFILL-OLD}$
REFILL-DATA

DELTA

FLAG $_{REFILL}$?

1040

FROM
FIG. 10B

A

TO
FIG. 10B

FULL

B

SAVE REFILL-DATA,
CRC $_{REFILL}$ TO
DATABASE

1045

1020 — CURRENT

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FROM
FIG. 10A

A

1000

THIS WILL ALMOST
ALWAYS RESULT
IN "YES"

1050

$CRC_{REFILL-OLD} = CRC_{REFILL-DATABASE}$?

YES

NO

$STATE_{REFILL} = REFILL-DATA + STATE_{REFILL-DATABASE}$
$CRC_{REFILL-OLD} = F(STATE_{REFILL})$

1065

SEND
GETSTRUCTUREDDEXDATA
REQUEST FOR FULL
REFILL DATA DELTA
CURRENT DATA

1055

1060

END

NO

$CRC_{REFILL-CALC} = CRC_{REFILL}$?

1070

YES

B

TO
FIG. 10A

CALCULATED
$STATE_{REFILL}$ MATCHED
THE $STATE_{REFILL}$ ON
THE DEVICE

FIG. 10B